

# Mental Health of Medical Students in Different Levels of Training

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## ABSTRACT

**Objectives:** Medical education and training can directly contribute to the development of psychological distress in medical students. This can lead to catastrophic consequences such as impaired academic performance, impaired competency, medical errors and attrition from medical school. This study aimed to assess the prevalence of psychological morbidity among Iranian medical students.

**Methods:** This was a cross-sectional study. Samples of medical students in different levels of training (basic science, clinical clerkship, internship, and residency stage) were entered into the study. The 12-item General Health Questionnaire (GHQ-12) was used to measure psychological morbidity. Both univariate and multivariate analyses were used to report on findings.

**Results:** In all, 220 medical students were invited to take part in the study. Of these, 192 students agreed to fill in the questionnaire. The mean age of respondents was 25.4 (SD = 5.2) and 53% were female. Overall 49.5% of the students scored above the threshold on the GHQ-12 (score > 3.5). The results obtained from logistic regression analysis indicated that female gender and level of training were the most significant contributing factors to increased psychological distress [OR for female gender = 2.99; OR for the basic science group = 6.73].

**Conclusions:** Psychological distress appears to be common in medical students and significantly varies by gender and level of training. The psychological well-being of medical students needs to be more carefully addressed, and closer attention to eliminating the risk factors is critical to prevent consequent adverse outcomes.

**Keywords:** Mental health, medical students, GHQ-12

## INTRODUCTION

In recent decades there is a growing attention to psychological distress among medical students. Stress among both medical students<sup>[1-6]</sup> and residents<sup>[7]</sup> has been investigated in several studies. At the start of medical school, medical students have mental health similar to nonmedical peers,<sup>[8]</sup> but frequent studies suggest that students' mental health worsens during the medical training.<sup>[1-6,9-14]</sup>

Several stressors threaten medical students' mental health. Common stressors include: adjustment to the medical school environment, educational debt, heavy workload, sleep deprivation, difficult patients, poor learning environments, financial

concerns, information overload and career planning.<sup>[1,7]</sup> These stressors can lead to catastrophic consequences such as anxiety, depression, impaired academic performance, impaired competency, medical errors and attrition from medical schools.<sup>[1,7,15,16]</sup>

In a large study in UK using the 12-item General Health Questionnaire (GHQ-12), 30.6% of first-year medical students, 30.6% of fourth year and 21.9% of fifth year medical students scored above the threshold indicating that medical students were suffering from some sorts of psychological distress.<sup>[4]</sup> Using the same questionnaire, a study from Turkey indicated that 47.9% of the second-year medical students experienced emotional disorders, well above the percentage of students studying economics (29.2%) and physical education (29.2%).<sup>[17]</sup> A study from Malaysia also reported that 41.9% of medical students experienced emotional disturbances.<sup>[18]</sup>

However, there is minimal information in the literature documenting the prevalence of psychological distress in Iranian medical students as well as residents. Hence, the aim of this cross-sectional study was to determine the prevalence of psychological morbidity among Iranian medical students in different levels of training. It was hoped that the study could contribute to the existing literature on the topic and provide information for possible future interventions.

## METHODS

### Participants

This was a cross-sectional study. All participants were recruited from Isfahan University of Medical Sciences (IUMS), Isfahan, Iran. Medical curriculum at undergraduate level in IUMS is divided into three periods: first five semesters of 'basic science', then six semesters of 'clinical clerkship', and finally three semesters of 'internship'. At the end of this period, students will graduate as a medical doctor and then if they wish they could take part in a national exam to enter into the postgraduate medical studies, known as 'residency' stage. Between January and June 2010, a stratified random sampling was done. Based on 95% confidence interval ( $P = 0.44$ ,  $d = 0.13$ ),<sup>[19]</sup> we considered 45 participants in each level of training. Students were asked to complete a self-rated instrument mea-

suring psychological distress as well as a short questionnaire containing items on demographic variables including age, gender, marital status and training level.

### Questionnaire

Psychological distress was measured using the Iranian version of the 12-item General Health Questionnaire, GHQ-12.<sup>[19]</sup> It is used to detect non-psychotic psychiatric disorders, such as depression and anxiety. The scale asks whether the respondent has experienced a particular symptom or behavior recently. Each item is rated on a four-point scale (less than usual, no more than usual, rather more than usual, or much more than usual). The GHQ-12 is a brief, simple, easy to complete, and its application in research settings as a screening tool is well documented. This questionnaire is translated and validated in Persian by Montazeri *et al.* in 2003 and they found that the Iranian version of the GHQ-12 is a reliable and valid measure and hence can be used for measuring psychological well-being in Iran (Cronbach's alpha coefficient = 0.87).<sup>[19]</sup> We used the original scoring method in this study. In this method response categories score 0, 0, 1, and 1 respectively. This gives scores ranging from 0 to 12. The higher values indicate more psychological symptoms.<sup>[20,21]</sup>

### Procedure

Between January 2010 and June 2010, the medical students were asked to complete the self-rated GHQ-12 questionnaire as well as a short questionnaire containing items on demographic variables including age, gender, marital status and training level. All participants were insured about confidentiality and were asked oral consent.

### Analysis

Descriptive statistics were used to present the demographic data and the scores for the GHQ-12. The Students' t-test and one-way analysis of variance were used for comparing. Logistic regression analysis was performed to assess the association between demographic data and the GHQ-12 scores. For the purpose of analysis

relative to threshold score for the Iranian adolescents (score > 3.5),<sup>[22]</sup> students were divided into two groups. The categorized GHQ-12 score was considered as dependent variable and age, gender, marital status, and level of training were considered as independent factors in logistic regression analysis. The analysis of data was performed by the Predictive Analytic Software (SPSS version 18) for windows.

## RESULTS

In all 220 medical students were invited (55 students at each level: basic science, clerkship, internship, and residency). Of these, 192 students agreed to take part in the study, giving a response rate of 87%. The mean GHQ-12 score was 3.90 (SD = 3.2), and about 50% of the students scored above threshold (score > 3.5).

There were no significant differences between genders with respect to marital status and level of training.

There were significant differences between students' GHQ-12 scores with regard to age, gender and level of training. The demographic characteristics of participants and descriptive findings are presented in Table 1.

The results obtained from logistic regression analysis indicated that gender and level of training were significant independent variables in predicting poor psychological distress among medical students. The female students showed a three fold (OR = 2.99, 95% CI = 1.58-5.66,  $P = 0.001$ ) and basic science students showed six times higher risk for scoring above threshold on the GHQ-12 (OR = 6.73, 95% CI = 2.13-21.2,  $P = 0.001$ ). The results are shown in Table 2.

**Table 1.** The characteristics of the study sample and descriptive findings ( $n = 192$ )

	No. (%)	GHQ mean score (SD)*	P value**
Age (year)			0.02
	< 22	59 (31)	4.37 (3.1)
	22-26	81 (42)	3.28 (3.0)
	27-30	16 (8)	2.87 (2.4)
	> 30	36 (19)	4.97 (3.6)
	Mean (SD)	25.4 (5.2)	
	Range	19-42	
Gender			0.008
	Male	91 (47)	3.25 (3.2)
	Female	101 (53)	4.48 (3.1)
Marital status			0.22
	Married	55 (29)	4.34 (3.4)
	Single	137 (71)	3.72 (3.1)
Level of training			0.004
	Basic Science	45 (23)	4.84 (3.2)
	Clinical Clerkship	58 (30)	3.19 (2.8)
	Internship	42 (22)	2.97 (3.0)
	Residency	47 (25)	4.70 (3.4)
GHQ score			
	Mean (SD)	3.90 (3.2)	
	Number (%) of students scored lower than threshold***	97 (50.5)	
	Number (%) of students scored above threshold	95 (49.5)	

\* Higher scores represent higher psychological distress.

\*\* Derived from t-test or one-way analysis of variance.

\*\*\* Threshold was derived from (22). [S6]: is O.K.

**Table 2.** The results obtained from logistic regression analysis for psychological morbidity

	OR (95% CI)	P
Age (year)	1.08 (0.95–1.24)	0.21
Gender		
Male	1.0 (ref.)	
Female	2.99 (1.58–5.68)	0.001
Marital status		
Married	1.00 (ref.)	
Single	1.16 (0.51–2.67)	0.72
Level of training		
Internship	1.00 (ref.)	
Basic Science	6.73 (2.13–21.2)	0.001
Clinical Clerkship	2.13 (0.91–5.89)	0.07
Residency	1.81 (0.45–7.29)	0.30

## DISCUSSION

The aim of this study was to assess the prevalence of psychological morbidity among Iranian undergraduate medical students in different levels of training. Nearly half of the students scored above threshold on the scale measuring psychological distress (GHQ), indicating significant mental problems. The results revealed that the medical students had a higher level of psychological distress compared to their peers in Iranian general population (44%).<sup>[19]</sup> In addition, the percentage of psychological morbidity determined by this study (50%) was found to be higher than those reported by Guthrie *et al.*<sup>[4]</sup> Aktekin *et al.* reported that the prevalence of psychological distress was 48% in the second-year Turkish medical students.<sup>[17]</sup> Also a lower prevalence of psychological morbidity was reported among Nepalese medical students (21%).<sup>[23]</sup>

Our findings showed that students in basic science level were more psychologically distressed than interns and students of clinical clerkship. Although not investigated in this study, the findings might be associated with heavy workload and forceful curriculum, poor campus conditions and complications in adjustment with the different environment in the university.<sup>[24]</sup> However, our findings are in line with previous studies; for instance, a study from Turkey reported that the global mental health, depression, and anxiety in medical students be-

came worse during the first year of medical education.<sup>[17]</sup> Another study on Swedish medical students showed that first year students indicated experiencing the highest degree of pressure.<sup>[25]</sup> Also a study at three medical schools showed that the level of depressive symptoms varies by year of training, with the highest during the second year.<sup>[26]</sup>

A number of studies reported different results. In a study from Brazil, the Beck Depression Inventory (BDI) score was determined for 481 medical students and they concluded that the internship period resulted in the highest BDI scores in comparison to both the basic and intermediate levels.<sup>[24]</sup> Studies from Pakistan and Thailand reported a higher level of stress among third and fourth year students.<sup>[27,28]</sup> However, the findings of our study did not support the above-mentioned results and the differences observed among several studies may be due to the different instruments used and curricula in these universities and countries. Therefore, it seems critical to evaluate any result in its own context or perhaps use instruments that especially developed for measuring distress in medical students.<sup>[29]</sup>

Psychological disturbance was more frequent in females than males and this result is compatible with previous studies indicating that women usually show higher levels of psychological distress than men in general population.<sup>[30]</sup> A recent publication indicated that since female students feel less social support thus they might suffer

from decreased sense of coherence which in turn is a strong explanatory variable for psychological distress among medical students in general and in female students in particular.<sup>[31]</sup>

The reasons for such high levels of psychiatric morbidity among medical students are likely to be complex, and to reflect both the environment and personal characteristics. In the first semester, there are major changes in the students' lifestyle.<sup>[8]</sup> Issues such as work overload, several examinations and competitive situation may lead to the development of depressive symptoms among medical students.<sup>[32]</sup> Therefore with early diagnosis and effective psychological services, possible future consequences may be prevented. Additionally, providing some welfare programs for married students and also educating the stress management and coping strategies can be useful in reducing students' distresses.<sup>[33-35]</sup> Furthermore, while personal factors may be more difficult to control, curricular factors such as the amount and intensity of work may need to be reviewed from an institutional perspective.

We believe that the question about the prevalence and variation of psychological distress in different levels of medical training seems to be sufficiently answered by this study; although, our study had certain limitations. Firstly, the cross-sectional design of this study did not allow us to determine the cause-and-effect relationship of psychological morbidity with stress and coping strategies. Also the GHQ is a general measure of mental health and it is not a measure of diagnostic depression. In addition, most of the data were obtained from self-reporting questionnaires and thus object to a potential source of bias. Despite these limitations, the current study appears to be unique in that it used a standardized measure to quantitatively evaluate the mental health of medical students in different level of training.

## CONCLUSION

Findings of this study indicated that psychological morbidity was common in medical students and this phenomenon was more obvious among students of basic science and females.

The psychological well-being of medical students needs to be more carefully addressed, and closer attention to eliminating the risk factors may prevent consequent distress. Further studies based on larger sample sizes are recommended to explore causes, consequences, and solutions for this problem rather than simply describing it.

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